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STORM SEWER SYSTEM

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5.00.00 INTRODUCTION

All storm sewer systems shall comply with the requirements of these STANDARDS AND SPECIFICATIONS. All work performed according to this section must comply with the general requirements contained within Chapter 1 and the acceptance requirements of Chapter 10. Special criteria shall be outlined at pre-design meetings and in the approved construction plans, as determined necessary by the City.

5.10.00 DESIGN CRITERIA

All subdivisions, resubdivisions, planned unit development, or any other proposed construction submitted for approval under the provisions of the City of Delta Municipal Code shall include adequate storm drainage system analysis and appropriate drainage system plans, wet stamped by a licensed professional engineer, in conformance with the requirements of the City of Delta. In cases where the construction of a storm drainage system is not feasible, the Responsible Party may request the use of on-site storm water retention. If this is allowed by the City, the Responsible Party shall have an appropriate storm water retention design prepared by a licensed professional engineer registered in the State of Colorado. Design criteria for this option shall be supplied by the City, at the time of approval. Either option chosen may require the completion of a drainage study.

5.20.00 CONSTRUCTION SPECIFICATIONS

5.21.00 EXCAVATION AND TRENCHING

Excavation, trenching and backfilling shall be done in accordance with Chapter 9 of these STANDARDS AND SPECIFICATIONS.

5.22.00 BEDDING

5.22.01 General

In the event unstable trench conditions are found at pipeline grade, a minimum of one and one-half inch uniformly graded, washed rock shall be used for trench stabilization. Depth of stabilization shall be as approved by the City. Pipe bedding shall be done in accordance with Sections 5.22.02 or 5.22.03 of these STANDARDS AND SPECIFICATIONS and the detail drawing in the Appendix of Chapter 4.

5.22.02 Class A Bedding

See Section 4.41.02 of these Standards and Specifications.

5.22.03 Class B Bedding (Granular II)

See Section 4.41.03 of these Standards and Specifications.

5.23.00 PIPELINE INSTALLATION

5.23.01 General

The City shall be notified at least 48 hours in advance of any pipe installation. No pipes shall be backfilled until they have been inspected by the City. Alignment and grade of the pipe and the location of fittings, manholes and inlets shall be staked under the supervision of a professional surveyor registered in the State of Colorado.

Proper implements, tools and facilities shall be provided and used by the Responsible Party for the safe and convenient execution of the work. All pipe sections, pre-cast manholes and inlets sections, shall be carefully lowered into the trench by means of a derrick, ropes or other suitable tools or equipment to prevent damage to storm sewer line material. Under no circumstances shall storm sewer line materials be dropped or dumped into the trench.

All pipefittings shall be carefully examined for cracks and other defects immediately before installation. The groove in the bells of the pipe shall be full and continuous or the pipe will be rejected. Defective pipe or fittings shall be removed from the job site within 24 hours of notification by the City. All foreign matter or dirt shall be removed from the interior and ends of the pipe before they are lowered into position in the trench and prior to connection.

Every precaution shall be taken to prevent foreign material and trench water from entering the pipe and fittings. During construction, the Responsible Party shall provide and maintain adequate equipment to properly remove and dispose of all water entering the trench and any other part of the work.

5.23.02 Pipe

Pipe shall be laid from downstream to upstream with spigot ends pointing downstream. All pipe shall be placed true to line and grade and carefully centered and with a smooth invert at the joint. The joint shall be made in a workmanlike manner and shall be watertight. Immediately before joining two lengths of pipe, the inside of the bell and the outside of the spigot end and the gasket shall be thoroughly cleaned. Caution shall be exercised to ensure that the correct type of gasket is used. A thin film of gasket lubricant shall be applied to the inside face of the gasket and the spigot end of the pipe. The spigot end of the pipe shall be placed in the bell with care to prevent the joint from contacting the ground. The joint shall be completed by pushing the pipe home with a slow steady pressure, without jerky or jolting movements. Pipe furnished without a depth mark shall be marked before assembly to ensure insertion to the full depth of the joint. The pipe shall then be properly set and brought to correct line and grade. The pipe shall be secured in place by installation of bedding material and backfill, in accordance with Chapter 9 and the detailed drawings in the Appendix of this chapter.

Cutting of pipe for inserting closure pieces shall be done in a neat and workmanlike manner without damage to the pipe or lining, leaving a smooth end at right angles to the axis of the pipe.

No pipe or appurtenant structure shall be installed upon a foundation in which frost has penetrated or at any time when the City deems there is a danger of ice formation or frost penetrations at the bottom of the excavation. No pipe or appurtenant structure shall be installed unless backfilling can be completed before the formation of ice and frost.

5.24.00 MANHOLE CONSTRUCTION

5.24.01 Cast-in-Place Base

See Section 4.43.01 of these Standards and Specifications.

5.24.02 Pre-Cast Base/Inverts

See Section 4.43.02 of these Standards and Specifications.

5.24.03 Pre-Cast Barrel

See Section 4.43.03 of these Standards and Specifications.

5.24.04 Inlets

Inlets shall be constructed with Class A concrete, placed on undisturbed ground and in conformance with the detail drawings in the Appendix of Chapter 6. The top portion of inlets shall be constructed concurrently with the adjacent curb and gutter to ensure proper alignment of grades unless otherwise permitted in writing by the City Engineer.

5.24.05 Manhole/Inlet Grouting Treatment

See Section 4.43.04 of these Standards and Specifications.

5.24.06 Adjustment Rings

See Section 4.43.05 of these Standards and Specifications.

5.25.00 CONNECTIONS TO EXISTING MANHOLES

See Section 4.44.00 of these Standards and Specifications.

5.30.00 TESTS

5.31.00 GENERAL

See Section 4.50.00 of these Standards and Specifications.

5.31.01 Lamping Test

See Section 4.50.03 of these Standards and Specifications.

5.31.02 Manhole Leakage Test

See Section 4.50.05 of these Standards and Specifications.

5.31.03 TV Inspection

See Section 4.50.06 of these Standards and Specifications.

5.40.00 MATERIAL SPECIFICATIONS

5.41.00 GENERAL

See Section 4.60.00 of these Standards and Specifications.

5.42.00 DEFECTS

See Section 4.61.00 of these Standards and Specifications.

5.43.00 CERTIFICATION

See Section 4.62.00 of these Standards and Specifications.

5.44.00 PIPE

5.44.01 Polyvinyl Chloride Pipe (PVC)

See Section 4.63.01 of these Standards and Specifications.

5.44.02 Reinforced Concrete Pipe (RCP)

See Section 4.63.02 of these Standards and Specifications.

5.44.03 Corrugated Aluminum Pipe (CAP)

CAP and coupling bands for culverts shall conform to the requirements of AASHTO M-196 Type I or Type II. The pipe shall be fabricated with helical corrugations and a continuous lock seam. CAP shall be joined with gasketed coupling bands made of the same alloy as the pipe. Bands shall be corrugated to match the pipe ends and form a watertight seal. Gasket material shall be neoprene or other approved synthetic rubber.

5.44.04 Corrugated Polyethylene (PE) Pipe

Corrugated polyethylene pipe shall conform to AASHTO M-252 for sizes 3” through 10” and to AASHTO M-294 for sizes 12” through 36”. PE pipe for storm drains shall have a smooth interior (Type S).

5.45.00 MANHOLES

5.45.01 General

See Section 4.64.01 of these Standards and Specifications.

5.45.02 Manhole Rings and Covers

See Section 4.64.02

5.45.03 Manhole Base Slabs

See Section 4.64.03 of these Standards and Specifications.

5.45.04 Joint Material

See Section 4.64.04 of these Standards and Specifications.

5.45.05 Mortar

See Section 4.64.05 of these Standards and Specifications.